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ABSTRACT

Numerous facets of curriculum evaluation are discussed. Recent developments in evaluation, characteristics of evaluation and evaluators, and specific characteristics of curriculum evaluation are examined. Several curriculum evaluation models are studied. (DG)

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TOWARD A CHARACTERIZATION OF CURRICULUM EVALUATION

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Revitalized interest in the teaching-learning process in American Education during the past twenty-five years or so has resulted in, among other things, a plethora of new curricula. The impetus given curriculum development has come both from subject matter scholars and educational researchers. From the former because of the discovery of new knowledge and insights into how their disciplines are structured. From the latter because of new insights into the learning process as it relates to the organization and presentation of knowledge. The development of any "new" curriculum has associated with it problems of evaluation. The evaluation of over-all effectiveness, cost, the type of variables influencing effectiveness, and relevance are a few of the areas in need of assessment. This problem of evaluation is probably of greater concern today than at anytime in history due to the great amount of knowledge which must be transmitted and processed, as well as the complexity of this knowledge. Evaluation techniques previously considered adequate for assessing the effectiveness of small units of material are significantly less applicable when imposed on larger chunks of information, the learning of which is highly complex, involves prerequisite learnings, and sequential behaviors, and perhaps other programs of study. The traditional dichotomy of experimental and control groups as examined by contrasting gross mean achievement scores in a pre-post treatment design study, although generally useful, tends not to provide sufficiently detailed information upon which to base intelligent decisions about questions related to curriculum effectiveness, validity, efficiency, etc. Along this line Guba[1] has recently lamented the failure of the evaluation designs for a group of recent government research proposals to meet even

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minimal requirements. Either the desire or need to compromise results in far too many "no significant differences". Guba notes for example that the practioner who is seeking information regarding the success of his program is faced with the problem that he has "invited interference". This is a condition opposite that of control. If we lack control, experimental design and methods of data analysis are considerably less applicable. Most applied studies are done in natural settings, and natural educational settings are anything but controlled. But it is in these relatively structured and uncontrolled situations that evaluation and decisions must be made. The field of curriculum evaluation is developing in response to many decision making requirements.

It is the intent of this paper to survey the origins of curriculum evaluation, and attempt to describe various dimensions that have changed over the years due to changes in society and education.

THE CHANGING FACE OF EVALUATION

An excellent overview of some recent changes in the concepts and techniques of evaluation has recently been presented by Merwin.[2] Some of these changes will now briefly be noted.

Evaluative Standards

Educational evaluators, both out of responsiveness to the evaluation task and due to the development of appropriate methodology have moved to a more absolute standard in assessing effectiveness of learning experiences. Such an approach would seem more responsive to the true meaning of the concept of individual differences in education. Emphasis is now on intra-individual comparisons, rather than inter-individual comparisons. This change in reference point from normative to absolute has influenced the

type of evaluation devices being developed. Greater concern is now given to criterion - referenced measures.[3] Such measures derive their structure and meaning from a specified set of objectives rather than the performances of groups of individuals.

Nature of Objectives Evaluated

The "what" of educational evaluation is also changing - changing in two dramatic ways. There is a movement away from the subject matter or content dimension of objectives toward more process oriented assessment. As new curricula emphasize change in process so must the attendant evaluations. The second change is toward a greater concern with affective educational outcomes. Educators and students are more aware of the importance of such factors as values, attitudes, beliefs and interests as they influence the teaching learning process. The publication several years ago by Krathwohl, et. al.[4] of a handbook dealing with affective educational objectives did much to provide an impetus to the movement. The whole behavioral objectives movement in education reflects the types of changes noted in this area.

Change In Sampling Unit

Historically evaluation has focused on the individual student and his learnings. If we are to understand the entire complex process of instruction, we need to also look at the learning environment and the nature of the learner, and the interaction of these factors. The learner, his environment and his learning need to be sampled. New techniques of data gathering need to be developed or old ones modified. New analysis procedures compatible with the complex nature of the inter-action of many variables need to be applied. In general we are moving from individual evaluation -

to group - to program and system wide assessment. Evaluation is becoming more "macro" and less "micro" in orientation.

Nature of Decision to be Made

Evaluation has traditionally been aimed at making decisions about individual student learning. Today's requirements are for data useful in making a variety of decisions in addition to those related to a specific learning experience. We are now faced with critical decisions about choice of curriculum, operating costs, selection of personnel, modification of program when recycled, adequacy of available resources, acceptance of program by community, and many others. These decisions are not only different in kind, but also in magnitude from those previously confronting the professional educator.

Time of Evaluation

Evaluative data are gathered at a time when they are most relevant to the decision making process. This may be before the learning program is implemented, during its development or at the end of the experience. In general there is more emphasis on measures of change rather than status. Considerable attention is being paid to long-term and longitudinal methodologies in curriculum evaluation.

It would be logical at this point to consider the nature of curriculum as it interacts with evaluation. Space limitations do not allow this, and basically the ideas have been covered elsewhere. Some curriculum workers would suggest that a curriculum is virtually that sum total of a child's experiences be they in class - out class, formal - informal, planned - unplanned, individual - group, or self-directed - teacher directed. Each form presents its own evaluation problems. Such questions, for example

as, "What of the unplanned-for changes in a student as he progresses through his educational career?", and "What are the peculiar requirements of evaluation in an individualized learning system?", need to be answered.

CHARACTERISTICS OF EVALUATION

The changing face of evaluation implies the changing roles it must assume. Educational evaluation is much more than the assessment of student performance as was suggested by Tyler[5] many years ago. In addition to contributing to the assessment of the over-all effectiveness of a total educational program, and validity of the assumptions underlying the program evaluation data can effectively be employed the improve the teaching-learning process. There is little doubt that the greatest contribution evaluation can make is to the improvement of educational programs. The intimate relationships between the teaching-learning process and evaluation have been admirably described by Dressel.[6] He discusses five points where the instructional process parallels that of evaluation. Following is a brief comparison of these two processes.

Instruction	Evaluation
1. Instruction is effective as it leads to desired changes in students.	1. Evaluation is effective as it provides evidence of the extent of the changes in students.
2. New behavior patterns are best learned by students when the inadequacy of present behavior is understood and the significance of the new behavior patterns thereby made clear.	2. Evaluation is most conducive to learning when it provides for and encourages self-evaluation
3. New behavior patterns can be more efficiently developed by teachers who know the existing behavior patterns of individual students and the reasons for them.	3. Evaluation is conducive to good instruction when it reveals major types of inadequate behavior and the contributory causes.

Instruction	Evaluation
4. Learning is encouraged by problems and activities which require thought and/or action by each individual student.	4. Evaluation is most significant in learning when it permits and encourages the exercise of individual initiative.
5. Activities which provide the basis for the teaching and learning of specified behavior are also the most suitable activities for evoking and evaluating the adequacy of that behavior.	5. Activities or exercises developed for the purposes of evaluating specified behavior are also useful for the teaching and learning of that behavior.

This focus on the relationship between instruction and evaluation and the potential contribution that evaluation can make to the improvement of quality and quantity in education has been underscored by the distinction between "summative" and "formative" evaluation recently made by Scriven.[7]

Summative and Formative Evaluation

Scriven[7] notes that the goal of evaluation is always the same - to determine the worth and value of something. That "something" may be a unit in art history, a science curriculum , a microscope, or an entire educational system. Depending upon what role the value judgments need to play, the evaluation data may be used developmentally or in a summary way. In the case of an overall decision the role of evaluation is summative. An end of course assessment would be considered summative. Summative evaluation may employ absolute or comparative standards and judgments, but more likely will employ the latter.

The role of formative evaluation on the other hand is almost exclusively aimed at improving the educational experience or product during its developmental phases. A key element in the formative evaluation strategy is feedback. Information is gathered during the developmental phase with an eye on improvement of the total product. Evaluation activities associated

with the development of Science - A Process Approach, the elementary science curriculum supported by the National Science Foundation and managed by the American Association for the Advancement of Science is illustrative. During the several years of development materials were tried out in centers throughout the country. Summer writing sessions were then held where tryout data were fed back to the developers. A superior product resulted. The summative-formative distinction among kinds of evaluation reflects differences in intent and decision making purpose, rather than differential methodology.

The use of evaluation in this formative way almost implies that evaluation may be viewed as a research effort. As a matter of fact Suchman[8] has formalized this idea. But there are dangers in treating the two processes alike.

Differences Between Research and Evaluation

Many experts view evaluation as merely the application of the scientific method to assessment tasks. In this sense, which parallels Suchman's use[8], "evaluative" becomes an adjective specifying a type of research. The emphasis is still on the noun "research" and the procedures for collecting and analyzing data which increases the possibility for proving rather than asserting the worth of some social activity. It is perhaps best not to equate the two activities of research and evaluation because of differences in intent and applicability of certain methodologies. Hemphill[9] has provided a very enlightening contrast between evaluation and research. Following is a brief comparison of these two activities.

Area	Research	Evaluation
1. Problem Selection and Definition	Responsibility of investigator	Determined by situation & constituents
2. Hypothesis Testing	Formal testing	General not done
3. Value judgments	Limited to selection of problem	Present in all phases of project
4. Replicability of Results	High likelihood	Low likelihood
5. Data Collected	Dictated by problem	Heavily influenced by feasibility
6. Control of Relevant Variables	High	Low
7. Generalizability of Results	Can be high	Usually low

Curriculum evaluation studies are generally undertaken to answer some very specific practical problems, usually at a local level. There is little interest in undertaking a project which will have implications for large definable displaced populations. Control of influential variables is generally quite restricted. It is for this reason that routine application of experimental designs (as described for example by Campbell and Stanley[10]) maybe inappropriate. Research in the behavioral sciences, in a restricted sense, is concerned with the systematic gathering of data aimed at testing specific hypotheses and contributing to a homogeneous body of knowledge.

The Place of Judgments in Evaluation

Values play an important role in curriculum evaluation from at least two standpoints. The first place where values assert themselves, or should be asserted, is in identifying those objectives and goals which have priority in terms of being evaluated. A determination of which objectives are most important should be made.[11] Secondly, judgments are continually

being made as performance data are contrasted with objectives. An excellent example of where this idea has been molded into an evaluation model can be found in the writings of Provus.[12]

Judgments are involved at many different points during the completion of an evaluation study. The decision to in fact do a sutdy is a value judgment. In addition several other judgments must be made. The role of judgment will depend on the amount of objective data that may or may not be available for decision making. The following list suggested by Brownell[13] highlights some decision points.

1. Determination of appropriate grade level for evaluative study
2. Selection of appropriate subjects
3. Length of study
4. Identification of objectives in common and those specific to curricula involved
5. Determination of type of study to be undertaken (e.g. cross-sectional, longitudinal, comparative, etc.)
6. Decisions about nature of data to be collected
7. Selection of data gathering instruments available or decision to develop original devices
8. Selection of appropriate control mechanisms aimed at uniformity of treatment
9. Selection of appropriate analysis procedures
10. Interpretation of findings

When all is said and done, the teachers have taught, the students have studied, the administrators have administered, the supervisors have supervised, and the consultants have consulted, the practical limitations of the evaluation climate and common sense, will, despite recent extraordinary technological developments, play the most influential roles in the design and implementation of an evaluation program.

Role of the Evaluator

Obviously, the evaluator will play many different roles depending upon the specific requirements of the evaluation task at hand. A great variety of competencies and skills need to be developed, and vast quantities

of knowledge digested and entered on memory drums. The variety of evaluators one might encounter is suggested by the following brief survey reported by Niehaus[14]. After suggesting that evaluators range from the knee-jerk conservative to the wild-eyed liberal, he describes different kinds of evaluators.

> There is the myopic nit picker who seems to have an anxiety compulsion to try to measure the differences between the tickel and itch. There is the cautious creeper who is terrified at the thought of any type of innovation. There is the free swinger who arrives at his evaluation through some weird mixture of ESP and dianoetics and whose ignorance is bolstered by emotion. There is the anxiety evaluator: the worrier, who lives under a perpetual state of existential threat and who feels that if what he evaluates does not coincide with his preconceived and doctrinaire attitudes, all is lost. There is the belaborer of the obvious who after a sizable expenditure of time and effort comes up with a ponderous announcement of something which has been obvious all along - something like the man who suggested, upon first viewing the Grand Canyon, "Something must have happened here." There is also the circumstantial evaluator who uses a hundred words to do the work of one. He gets his observations wound up into such a cocoon that no one can figure out just what he is trying to communicate.

In a more serious vein it must be accepted that a well-trained, sensitive, effective and competent evaluator must be both scientist and human relations expert. There are certain technical skills and knowledges to be mastered. In addition, a great part of the evaluators time will be given over to working with individuals and groups to plan, implement and communicate the results of the evaluation effort. The role of the evaluator,if viewed objectively and honestly is an enormous one. To describe it's dimension is an almost impossible task. It is therefore, not without some trepidation that the following list of behavioral objectives is suggested. These competencies represent the distilation of a variety of sources.[15]

The Competent Curriculum Evaluator Should Be Able To:

1. Specify information needs from program planning for evaluation
2. Develop a plan for evaluating a specified curriculum
3. Locate, read, and integrate relevant research, measurement, and evaluation literature.
4. Specify evaluation objectives and data base requirements in appropriate form(s)
5. Critically evaluate a given evaluative research design
6. Relate theoretical evaluation models and "real life" requirements
7. Relate input, transaction and outcome variables
8. Demonstrate appropriate interpersonal relationship skills in working with evaluation team and program staff
9. Differentiate advantages and disadvantages of cross-sectional and longitudinal studies
10. Conduct systems, functions, and task analyses
11. Design an effective measurement - management process
12. Compile a master evaluation system from several systems
13. Describe evaluation design and analysis requirements in computer programmer or data processing terms
14. Specify criteria for selection or development of evaluation instruments
15. Apply appropriate data gathering procedures
16. Apply appropriate data analysis procedures
17. Make a cost benefit analysis of a given curriculum
18. Use evaluation information to make decisions about curricula
19. Design a Program Planning Budgeting System
20. Administer the activities of an evaluation unit
21. Design a system of data presentation which describes format, responsibility, procedures, recipients, and schedule.
22. Redesign and refine evaluation system based on data implications of previous cycle

This list is obviously not exhaustive. It does, however, reflect certain emphases weighted by real time and experience factors, and hopefully capture the flavor of how and what the curriculum evaluator must actually do in a real life situation to function effectively.

CHARACTERISTICS OF CURRICULUM EVALUATION

Curriculum evaluation could be conceived of as the sum total of the topics thus far discussed. Such a statement sounds almost platiduinous. But in a very real and meaningful sense the statement is true. Curriculum evaluation will play many roles contingent upon the demands and constraints placed upon it. Heath[16] for example, suggests three broad functions performed by curriculum evaluation.

1. Improvement of Curriculum During Development Phase: Again the importance of formative evaluation is emphasized. Strengths and weaknesses of the program or unit can be identified and capitalized on or strengthened. As Heath[16] notes the process is iterative with continuous recycling of try-out - evaluation - redesign activities.
2. Facilitate Rational Comparison Among Competing Programs: Although there is the large problem of differing objectives, description and judgment of alternative programs can lead to rational decision making.
3. Contribution to General Body of Knowledge About Effective Curriculum Design: Freed from the constraints of formal hypothesis testing curriculum evaluators are at liberty to search out basic principles relating to the interaction of learner, learning and environment.

One is still left with the question as to what ways curriculum evaluation is different from either pure research efforts or the straight forward evaluation of learning. Following is a list of variables which may reflect a differential emphasis within curriculum evaluation. The emphases reflect just that, weightings reflecting the ways in which curriculum evaluation programs are practically implemented.

1. Content of Goals - The objectives of curriculum evaluation tend to be more process and behaviorally oriented than concerned with subject matter content.
2. Breadth of Objectives - Not only are the objectives different in content, but a greater range of phenomena are involved.
3. Complexity of Outcomes - Changes in the requirements for living and education, and the increased knowledge we now possess about

the teaching-learning process dovetail into objectives which are quite complex from the standpoint of cognitive and performance criteria. The interface of cognitive, affective and psychomotor variables further complicates our ability to see what must be evaluated.

4. Focus of Total Evaluation Effort - There is a definite trend for a shift from individual learner to total program.
5. Context of Evaluation - As much as possible curriculum evaluation should take place in a naturalistic setting. It is in the real-life setting with all its unpredictable contingencies and uncontrolled variables that education takes place. If we teach in that setting we must evaluate in that setting, and this is where the decisions are made.

The following statement probably best summarizes what contemporary curriculum evaluation is all about.

> Curriculum evaluation can be viewed as a process of collecting and processing data pertaining to an educational program, on the basis of which decision can be made about that program. The data are of two kinds: (1) objective description of goals, environments, personnel, methods and content, and immediate and long range outcomes; and (2) recorded personal judgments of the quality and appropriateness of goals, inputs and outcomes. The data--in both raw and analyzed form--can be used either to delineate and resolve problems in educational programs being developed or to answer absolute and comparative questions about established programs.[17]

This broad general description allows the form of a final curriculum evaluation plan to take on any shape dictated by it's requirements. Some general plans or models have been proposed. Illustrative models are described in the following section.

Models For Curriculum Evaluation

It is frequently helpful to formalize a complex process, such as curriculum evaluation, into a model. The shape of the model will frequently take the form

of some type of conceptual paradigm, flow chart or other type of schematic. Several authorities writing in the field have presented such formal models. The value of such abstract representations is somewhat open to question. But they do assist in examining relationships among various components as activities, and help define activities and point the way toward possible new applications or research problems. In general a model will aid in the planning and implementation of curriculum evaluation[26]. One major danger of too great a reliance on a model is the distinct possibility of routinizing what should be an ever changing process. Such a danger exists, particularly if the evaluation has been pretty well institutionalized.

An attempt has been made in Table 1 to collect a representative group

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Insert Table 1 about here

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of curriculum evaluation models. Each is briefly described in terms of its major emphasis. The overlap in terms of both approach, content and methodology is considerable among models. Therefore, only those key emphases are described. Many educators have made significant contributions to the topic and related issues but have failed to put forth a systematic design for curriculum evaluation, where detailed descriptions or outlines of specific activities are availble. To be included in the summary of models in Table 1 a developer must have presented either a verbally or schematically detailed outline of the elements in his model and description of a sequence of activities.

Table 1 is presented merely to reflect the flavor of the models available. As was noted previously, the actual overlap is considerable. The specification of instructional objectives plays a central role in most all models, as does a selection of data gathering instruments phase. All emphasize

feedback and recycling phases. There is also present the assumption that a needs assessment has been carried out prior to program development. Models will also differ if the questions asked relate to the evaluation of a single curriculum or are comparative in nature. And finally all models emphasize decision making and reflect the biases and peculiar intents of their developers.

Several comments on some of the models are in order. The evaluation model of Tyler[5] is probably the most well known prototype, at least from a historical perspective. His thinking has significantly influenced both evaluation and curriculum for many years. His emphasis is on the individual learner. The "discrepancy model" proposed by Provus[12] reflects a highly complex set of criterion questions, and is probably the most involved and detailed model on the list. Taylor and Maguire[17] and Metfessel and Michael[18] are somewhat unique by virtue of their involvement of a large sample of people concerned with the educational process. Taylor and Maguire[17], for example, have pointed out five important groups whose opinions should be consulted at various stages of evaluation - spokesman for society of large, subject-matter experts, teachers,parents, and the students themselves. The counsel of these groups is particularly important during the specification of objectives. This was the approach used by National Assessment in establishing their objectives. Too many opinions can of course have the adverse effect of diluting the product. The model proposed by Stake[20] with its emphasis on observation and judgment data is potentially one of the most valuable yet conceived. The school accreditations model[19] frequently leaves the staff exhausted and generally does not yield meaningful results. And finally, an example of the concerns expressed

by Light and Smith[25] are reflected in the evaluations undertaken in behalf of Head Start. The CIPP model (Context-Input-Process-Product[23]) has achieved considerable acceptance by both theoreticians and working evaluators.

In an effort to better visualize the evaluation process an attempt has been made to depict the usual steps in the process. Figure 1 summarizes this effort. The activities are in approximate order both in terms

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Insert Figure 1 about here

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of logic and temporal sequence. Application of PERT and other management techniques can be extremely valuable when implementing an evaluation program such as that suggested by the activities listed in Figure 1. It can be seen that only the major activities are identified. The assumption is made that decision-making is taking place both within as well as between blocks. Decisions may be of go - no go variety, related to appropriateness of criteria, or focused on information, processing, reporting, and feedback. The development of an accepting climate which is supportive of evaluation is an important dimension of the entire process. The importance of interpersonal skills to the evaluator, therefore, cannot be underestimated. The sequence of activities may be followed if summative evaluation is the role being played, or they may be repeated with recycling if formative evaluation is the primary focus.

If applied logically, intelligently, and realistically the process of curriculum evaluation can lead to decisions which can serve as a powerful force to improve the conditions in our schools. In addition, in this day of "accountability" curriculum evaluation systems can provide the means whereby a fair base for judging educational effectiveness is made available.

FOOTNOTES

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14. Stanley W. Niehaus, "The Anatomy of Evaluation", The Clearing House 42 (February, 1968): 332-336.

15. Among these sources were: Hulda Grobman, Evaluation Activities of Curriculum Projects (Chicago, Rand McNally, 1968); Garth Sorenson, "A New Role in Education: The Evaluator", Evaluation Comment - Center

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TABLE 1

Key Emphases of Selected Curriculum Evaluation Models[1]

Model Developer	Key Emphasis	Model Developer	Key Emphasis
Tyler[5]	Curriculum objectives and evaluating student progress.	Crane & Abt[21]	Estimating cost-effectiveness of alternative curriculum materials.
Provus[12]	Assessing discrepancy between program performance and standards.	Welch & Walberg[22]	Improvement of college physics curriculum using change data.
Taylor & Maguire[17]; and Metfessel & Michael[18]	Objectives and involvement of variety of personnel (e.g. layman, professional educator, students, philosophers, psychologists.)	Stufflebeam[23], and Klein, et. al.[24]	Rational decision making among alternatives by administrator.
		Light & Smith[25]	Evaluating national intervention programs through *post hoc* survey.
NSSSE[19]	Staff self-study with overview of content, facilities and procedures		
Stake[20]	Gathering and processing description and judgment data		

[1]Based on an idea suggested by a chart developed by Dr. Robert E. Stake, Center for Instructional Research and Curriculum Evaluation, University of Illinois, 1969.

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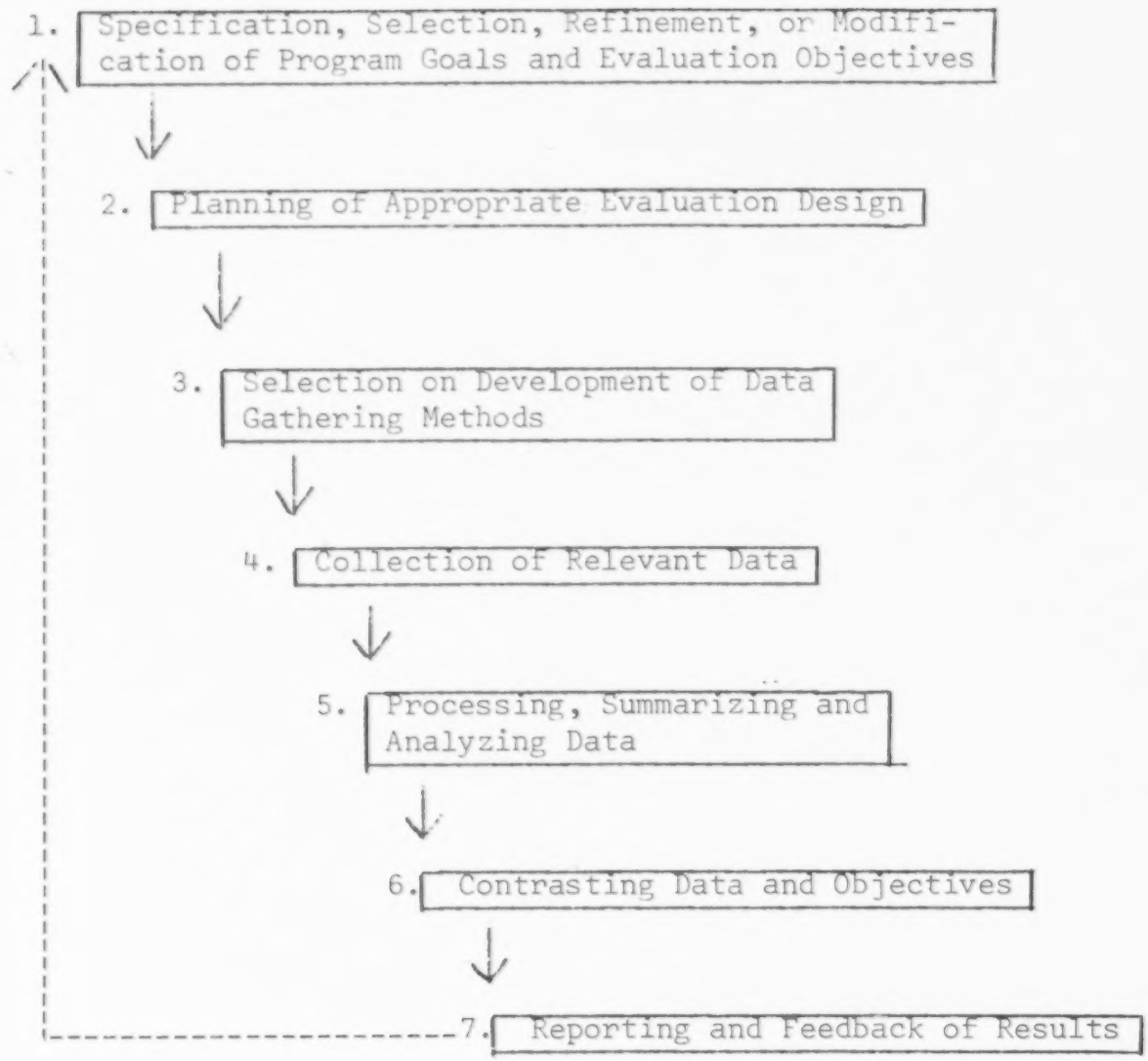
1. Specification, Selection, Refinement, or Modification of Program Goals and Evaluation Objectives
2. Planning of Appropriate Evaluation Design
3. Selection on Development of Data Gathering Methods
4. Collection of Relevant Data
5. Processing, Summarizing and Analyzing Data
6. Contrasting Data and Objectives
7. Reporting and Feedback of Results

Figure 1. Overview of Usual Steps in Curriculum Evaluation Process